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Department of Health Services



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TO: Infection Control Practitioners
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Subject: Severe Acute Respiratory Syndrome (SARS) – Infection Control
Recommendations, Update of June 12, 2003.

The California Department of Health Services (CDHS), Division of Communicable Disease Control (DCDC) and the Licensing and Certification (L&C) Program have jointly developed new and revised infection control recommendations for Severe Acute Respiratory Syndrome (SARS). The recommendations are based in part on the Centers for Disease Control and Prevention (CDC) revised interim recommendations, but may differ based upon CDHS experience with SARS-associated problems.

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Infection Control Practitioners should carefully review the recommendations before developing revised hospital specific procedures. These recommendations should be distributed to all hospital departments, services and medical specialties responsible for admitting, diagnosing and treating and discharging patients with suspected SARS including, but not limited to, hospitalists, intensivists, pulmonologists and infectious disease physicians.

Comments and suggestions for improving these recommendations as well as questions about the prevention and control of SARS should be addressed to Chris Cahill, MS, RN (ccahill@dhs.ca.gov) or Jon Rosenberg, MD (jrosenbe@dhs.ca.gov).

Information on SARS is available at the CDC (www.cdc.gov/ncidod/sars/) and WHO (www.who.int/en/) web sites.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES SEVERE ACUTE RESPIRATORY SYNDROME (SARS) INFECTION CONTROL RECOMMENDATIONS HOSPITALIZED PATIENTS

California Department of Health Services (CDHS) infection control recommendations for patients hospitalized with severe acute respiratory syndrome (SARS), issued April 7, 2003, have been revised to include current information released by the Centers for Disease Control and Prevention (CDC) and recommendations developed by the CDHS Division of Communicable Disease Control. The changes include recommendations for personal protective equipment including respiratory protection, triage and disposition, and cleaning and disinfecting patient rooms.

Infection Control Practitioner (ICP)

Infection control practitioners should be notified immediately when a suspected or probable SARS case is admitted to the hospital, emergency department or outpatient clinic services.

Reporting

All cases of suspected and probable SARS should be reported within one working day to the local health department. The case definition is subject to change as more is learned about SARS. The most current definition can be found at www.cdc.gov/ncidod/sars.htm.

Room Placement

Patients with suspected or probable SARS should be isolated, ideally, in negative pressure rooms with adjoining anterooms. However, these facilities may be limited or, in some hospitals, non-existent. Several options for isolating patients are presented. Plan A or B is the best approach for a limited number of cases. Plan C may have to be implemented to accommodate a large number of patients.

Plan A: - Airborne (Negative Pressure) Isolation Room: Place the patient in a private room that has (1) monitored negative air pressure in relation to the exterior surrounding areas, (2) 6 -12 air changes per hour (ACH), and (3) appropriate venting of contaminated air to the outside. If at least 6 ACH cannot be achieved, place a HEPA filtration unit in the room. The windows and doors should remain closed and the patient should remain in the room.

Plan B: – No Negative Pressure Room: Place the patient in a private room, equipped with a HEPA filtration unit. The windows and doors should remain closed and the patient should remain in the room. If a HEPA filtration unit is not available, place the patient in a private room with the doors closed.

Plan C: – Designated Nursing Unit: If the number of patients requiring hospitalization and isolation increases, consider designating a wing of a nursing unit or, preferentially, an entire nursing unit. Infection control practitioners should develop a plan consistent

with the structure of the hospital and the ability to effectively isolate infected patients from non-infected patients.

Visitors

A system for screening visitors for fever or respiratory symptoms (e.g., cough or shortness of breath) should be developed and implemented. Close contacts (e. g., family members and friends) with either fever or respiratory symptoms should not be allowed to enter the hospital. This information should be posted at all entrances and written instructions should be provided to persons such as volunteers who staff hospital information booths. Asymptomatic visitors should be restricted to persons 16 years of age or older, limited to one person at a time and instructed to wear personal protective equipment including a surgical mask over their nose and mouth while in the patient's room. If the surgical mask does not fit tightly, visitors should be requested not to enter the patient's room. Hospitals should educate visitors about infection control procedures, including hand hygiene, to be taken before leaving the patient's room.

Hospital Discharge

The local health department should be notified within 24 hours prior to discharging a SARS patient or if the patient leaves the hospital against medical advice. The local health department may issue a home isolation agreement (See Model Home Isolation Agreement) to patients at the time of discharge. This agreement summarizes infection control precautions the patient will be expected to follow after discharge and for 10 days after the resolution of fever provided that respiratory symptoms are absent or improved.

Personal Protective Equipment (PPE)

To minimize the risk of an unprotected exposure event, Healthcare workers (HCW) should wear personal protective equipment when in the room of a patient who is coughing or receiving aerosol-generating procedures. Personal protective equipment includes respiratory protection (e.g., N95 or higher level respirators), gowns, gloves, head and facial covers, tight fitting eye protectors (goggles) and full-face face shields. Aerosol-generating procedures include, but are not limited to, aerosolized medication treatments (e.g., albuterol), sputum induction, bronchoscopy and suctioning.

Respiratory Protection

Respirators should be used in accordance with the CAL-OSHA regulations (www.dir.ca.gov/title8/5144.html or www.osha.gov/SLTC/etools/respiratory). This includes training and fit testing of each healthcare worker, regardless of job classification, who may be exposed to a SARS patient to ensure a proper fit between the respirator's sealing surface and the wearer's face.

Disposable Respirators

Disposable, NIOSH-certified, fit-tested N95 respirators should be worn when entering the room and removed immediately after leaving the room. Once worn in the presence of a SARS patient, the outside of the respirator should be considered potentially contaminated with infectious respiratory particles and touching the outside face piece of the device should be avoided. After leaving the patient's room the respirator should be

removed by grasping only the head straps and discarded in a non-biohazard waste receptacle. Hands should be washed or decontaminated with an alcohol-based hand hygiene product.

Respirator Reuse

If a sufficient supply of N95 respirators is not available, reuse should be considered. Reuse may increase the potential for healthcare worker contamination; however, the risk must be balanced against the need to provide respiratory protection. If reuse is necessary, the following procedure should be considered.

- Wear a loose-fitting barrier such as a fluid-resistant surgical mask over the respirator face piece. The barrier should not interfere with the respirator fit or seal and should not impair breathing.
- Before leaving the patient's room, remove the face shield and surgical mask, discard in a non-biohazard waste receptacle and wash or decontaminate hands.
- After leaving the patient's room, remove the goggles then remove the respirator by grasping only the head straps used to secure the device to the face. Place the respirator in a plastic or paper bag, label with the healthcare worker's name and wash or decontaminate hands.
- To reuse the respirator, remove it from the bag by grasping only the head straps and place a disposable tissue (Kleenex) over the front of the face piece.
- Prior to putting the used respirator on the face, check the device for obvious tears, creases, soil or other damage.
- Secure the device, do fit checking and wash or decontaminate hands before putting on the other personal protective equipment.
- Discard the respirator at the end of the shift or when soiled, damaged or torn.

Surgical Masks

If N95 or a higher level of respiratory protection (N99, N100) is not available due to supply shortages, tight fitting, fluid-resistant surgical procedure masks will provide barrier protection against large droplets considered to be the primary route of SARS transmission. Surgical masks may not adequately protect healthcare workers from exposure to airborne aerosolized particles generated by coughing patients, or patients who are post bronchoscopy or receiving aerosol-generating respiratory therapy treatments because these masks allow for leakage around the face and cannot be fit-tested.

Elastomeric and Powered Air Purifying Respirators

A higher level of respiratory protection should be considered for certain aerosol-generating procedures (See Aerosol-Generating Procedures). When elastomeric (rubber) or powered air purifying respirators (PAPR) are used on more than one healthcare worker, the reusable elements should be cleaned and disinfected after each use according to manufacturer's suggested recommendations. When half- or full- face elastomeric negative pressure respirators are used by more than one healthcare worker, the filters should be replaced between each individual user. If PAPR are used

the filters should be replaced using the manufacturer's suggested recommendations. Used filters should be discarded according to manufacturer's instructions.

Facial Protection

Eye Protectors (Goggles)

Wear tight fitting goggles when in the room of a suspected or probable SARS patient who is coughing or receiving aerosol-generating procedures. Remove the goggles by grasping the elastic head straps. Goggles should be decontaminated with an EPA-registered disinfectant after each use and before assignment to another healthcare worker.

Face Shields

In addition to eye protectors, wear a disposable or reusable full-length face shield when entering the room. Disposable face shields should be removed just prior to exiting the room and discarded. Reusable face shields should be decontaminated with an EPA-registered disinfectant after each use and before assignment to another healthcare worker.

Gowns

Disposable gowns or full body isolation suits (coveralls) should be worn when entering the room. Full-body isolation suits may provide better protection for exposed skin in the neck area. Some suits provide attached hoods that cover the hair. Gowns should be carefully removed and discarded in a non-biohazardous waste receptacle before exiting the room.

Gloves

Disposable gloves that cover the cuffs of the gown should be worn when entering the room. Gloves should be removed before exiting the room and discarded in a non-biohazardous waste receptacle.

Head and Facial Surgical Covers

Head and facial surgical covers that completely cover the hair and skin on the face and neck should be worn when entering the room. Covers should be removed before leaving the room and discarded in a non-biohazardous waste receptacle.

Handwashing

Hands should be washed with soap (antimicrobial or plain) and water after unprotected (ungloved) contact with visible blood, body fluids (respiratory and nasal secretions, excretions [urine, feces], wound drainage and skin visibly soiled with blood and body fluids). If hands are not visibly soiled, an alcohol-based hand hygiene product can be used to decontaminate hands after patient contact. After handwashing or hand decontamination, avoid touching the patient, surfaces or items in the immediate vicinity of the patient (bed rails, bedside tables).

Transporting Patients

Patients should not be transported to other areas of the hospital unless absolutely necessary. If patients must be transported, place a surgical mask over patient's nose and mouth, if tolerated. If an elevator is used to transport patients, all occupants should wear personal protective equipment including N95 respirators.

Laboratory Specimens

Specimens should be placed in zip-lock bags that are tightly sealed and properly labeled.

Patient Care Equipment

Patient care equipment (e.g., thermometers, blood pressure cuffs, stethoscopes and commodes) should be kept in the patient's room. Use disposable equipment whenever possible. Reusable equipment should be disinfected at the end of each shift. Upon patient discharge, reusable equipment should be placed in an appropriately labeled container, sealed and transported to central service for reprocessing.

Environmental ServicesDaily Cleaning

Environmental service personnel should be specifically trained and supervised in cleaning and disinfection methods and in wearing personal protective equipment, including respiratory protection. Patient rooms should be cleaned and disinfected with an Environmental Protection Agency (EPA) registered detergent-disinfectant such as a quaternary ammonium or phenolic compound. Manufacturer's recommendations for use-dilution (concentration) and surface contact time should be followed.

Daily cleaning and disinfection should include horizontal surfaces (e.g., over-bed table, night stand, chair, bedrails) as well as surfaces frequently touched by patients (e.g., bathroom fixtures, bed rails, telephone, television and call light cables and casings) and the healthcare worker (e.g., bed rails, door knobs, light switches and medical equipment and regulators). Medical equipment such as IV poles, pumps and mechanical ventilators should be disinfected daily, after they have been touched with soiled gloves and at the end of each work shift. Disposable and reusable medical supplies and linens should be kept to a minimum in the patient's room. Vacuums and spray-buffing in the patient's room should be avoided.

Buckets containing disinfecting solutions should be discarded before exiting the patient's room. Reusable cleaning cloths and mop heads should be placed in a laundry hamper before exiting the room. Aerosol spray bottles should not be used to apply the disinfectant solution onto environmental surfaces. Disinfecting solutions should be mixed fresh daily and placed in plastic containers that, when inverted and gently squeezed, dispense or pour the solution directly onto a surface or a cloth as opposed to a spray-nozzle. Small containers of a pre-mixed disinfecting solution and cleaning cloths should be kept in the patient's room. The container should be rinsed with tap water and dried before refilling.

Terminal Cleaning

Terminal cleaning and disinfection following discharge and transfer should be postponed to allow for the removal of residual viral particles by the ventilation system. The following table provides an approximation of air cleansing times based on the number of air changes per hour (ACH)

(www.cdc.gov/mmwr/preview/mmwrhtml/00035909.htm).

TABLE S3-1. Air changes per hour (ACH) and time in minutes required for removal efficiencies of 90%, 99%, and 99.9% of airborne contaminants

Minutes required for air removal efficiency of:

ACH	90%	99%	99.9 %
1	138	276	414
2	69	138	207
3	46	92	138
4	35	69	104
5	28	55	83
6	23	46	69
7	20	39	59
8	17	35	52
9	15	31	46
10	14	28	41
11	13	25	38
12	12	23	35

Reusable medical equipment such as ventilators, IV poles and pumps, and pulse oximeters should be disinfected before removed from the room, covered and taken to central processing for final processing.

Cubicle curtains should be changed and laundered or, if disposable, discarded. Pillows and mattresses should be cleaned and disinfected. Walls, windows and drapes or blinds or other vertical surfaces do not require terminal cleaning unless visibly soiled. Fogging for the purpose of air cleansing is not necessary.

Soiled Linen

Soiled linen should be handled according to standard hospital policy.

Biohazard Waste

Disposable items removed from the patient's room should be handled according to standard hospital policy.

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
INFECTION CONTROL RECOMMENDATIONS
EMERGENCY DEPARTMENTS**

The following infection control recommendations have been developed to assist emergency department healthcare workers (HCW) to triage patients who may be ill with severe acute respiratory syndrome (SARS). These recommendations are consistent with the Centers for Disease Control and Prevention (CDC) *Updated Interim Domestic Guidelines for Triage and Disposition of Patients Who May Have Severe Acute Respiratory Syndrome (SARS)* published on April 25, 2003: (www.cdc.gov/ncidod/sars/triage_interim_guidance.htm).

Case Definition

Because the definition is subject to change, emergency department physicians and nurses should consult the CDC web site: www.cdc.gov/ncidod/sars for the most recent case definition.

Patient Triage

Because patients developing SARS may initially present with only a fever or respiratory symptoms (e.g., cough or shortness of breath), isolation (e.g., placing a surgical mask over the nose, mouth of a coughing patient) should be implemented as soon as the patient arrives in the emergency department (ED). Currently most patients developing SARS will have a history of international travel to SARS-affected geographical areas or a recent exposure to a person known to have symptoms of SARS. However this assumption may not be valid if SARS spreads into the community. To reduce the possibility of exposure to SARS, emergency department personnel should implement the following infection control precautions:

- Post a sign outside the ED entrance, informing patients of the need to take special precautions before or immediately upon entering the facility. As an example:

To all patients:

To prevent the transmission of severe acute respiratory syndrome (SARS) and other respiratory infections to healthcare workers and other patients, please follow these instructions:

IF YOU HAVE A FEVER OR NEW COUGH OR DIFFICULTY BREATHING

PLEASE

1. Place a surgical mask, located (location of mask instructions) firmly over your nose and mouth before entering this health care facility.
2. Immediately inform personnel at the front desk of your symptoms.

THANK YOU FOR PROTECTING OUR PATIENTS AND HEALTHCARE WORKERS

First Point of Contact

- Healthcare workers who are the first points of contact (e.g., registration personnel, volunteers, etc.) should be trained to screen patients for symptoms of SARS. To facilitate the identification of patients who may have SARS, targeted screening questions concerning fever, respiratory symptoms, and recent travel or exposure history should be performed by a trained healthcare worker as soon as possible after patient enters the facility.
- Patients with fever or respiratory symptoms should not remain in the waiting room but should be taken immediately to an airborne isolation or HEPA filtered examination room and the door should remain closed.
- The patient should be instructed to wear a surgical mask over their nose and mouth at all times while in emergency department and during transport to diagnostic services or a nursing unit.
- Emergency Department personnel examining the patient should wear personal protective equipment (PPE) as described in the California Department of Health Services document *Infection Control Recommendations - Hospitalized Patients* when in the examination room.
- If, after physical assessment, a diagnosis of SARS is likely, the emergency department staff should immediately notify infection control practitioner. If the infection control practitioner is not immediately available, emergency department staff should notify the local health department.
- Patients should not be hospitalized for isolation purposes alone. However, if a diagnosis of SARS is likely, emergency department personnel should assess the patient's home environment (e.g., jail, student dormitory, homeless shelter, multiple person single room dwellings) to determine if home isolation is feasible. If home isolation is not a feasible option, hospitalization may be necessary until alternative living arrangements can be made. The local health department should be notified to assist in making alternative living arrangements.
- Patients with suspected or probable SARS and their family members should be given a copy of *Infection Control Recommendations - Home Settings* at the time of emergency department discharge. They should also be informed that a representative from the local health department might assess compliance with and necessity for home isolation.
- Patients should be provided with and instructed in wearing a surgical mask when in the presence of non-infected persons including healthcare workers, local health department personnel and transportation personnel.
- Family members should be instructed to seek medical evaluation if they develop a fever or a cough.

Personal Protective Equipment

Healthcare workers assigned to the emergency department should follow the infection control recommendations developed for hospitalized patients (see *Infection Control Recommendations - Hospitalized Patients*).

Patient Care Equipment

- Reusable examination equipment (e.g., stethoscopes, blood pressure cuffs, electronic thermometers, pulse oximeters) should be disinfected with a properly diluted, EPA-registered hospital detergent-disinfectant solution after use on a SARS patient.
- Environmental surfaces (examination tables, chairs, countertops, etc.) should be disinfected after the patient leaves the examination room and before admitting another patient to that room.
- Disposable examination gowns and sheets should be placed in a plastic leak-proof bag and disposed of according to hospital policy.
- Reusable linens should be placed in leak-proof bags and laundered according to hospital policy.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES SEVERE ACUTE RESPIRATORY SYNDROME (SARS) INFECTION CONTROL RECOMMENDATIONS OUTPATIENT CLINIC AND PHYSICIAN OFFICE SETTINGS

The following infection control recommendations have been developed to assist healthcare workers (HCW) in outpatient (ambulatory care) clinics and physician's offices to triage patients who may be ill with Severe Acute Respiratory Syndrome (SARS). These recommendations are consistent with the CDC *Triage of Patients Who May Have Severe Acute Respiratory Syndrome: Interim Guidance for Screening in Ambulatory Care Settings*, April 25, 2003 (www.cdc.gov/ncidod/sars/triage_interim_guidance.htm). The most recent case definition for SARS, accessible at www.cdc.gov/ncidod/sars/casedefinition.htm, should be used as a basis for screening questions.

Patient Triage

- Post a sign outside the clinic or office entrance informing patients of the need to take special precautions. As an example:

To all patients:

To prevent the transmission of severe acute respiratory syndrome (SARS) to healthcare workers and other patients, please follow these instructions:

If you have a fever and a new cough and/or difficulty breathing

PLEASE

1. Place a surgical mask, located (location of mask instructions) over your nose and mouth before entering this health care facility.
2. Inform the assistant at the front desk of your symptoms.

THANK YOU FOR PROTECTING OTHER PATIENTS AND HEALTHCARE WORKERS

These precautions could be specific to those with a history of travel to an area of SARS transmission (see Case Definition, above) or to all those with a fever and new respiratory symptoms, which could limit the transmission of other respiratory pathogens in these settings.

- Healthcare workers who are the first points of contact should be trained to screen patients for SARS.
- If possible, triage all patients when they call for an appointment. If SARS is a likely diagnosis, the patient should be instructed to go immediately to the nearest emergency department, bypassing the physician's office or outpatient clinic.
- To facilitate identification of patients who may have SARS, targeted screening questions concerning fever, respiratory symptoms, and recent travel should be performed as soon as possible after patient arrival.
- Healthcare workers working at the front desk should put on an N-95 respirator when exposed to a suspected case of SARS. If N-95 respirators are not available, the healthcare worker should put on a surgical mask.
- The patient should be instructed to wear a surgical mask over their nose and mouth at all times while in an outpatient clinic or physician's office waiting area, examination room and during transportation to the emergency department.
- Patients with fever and respiratory symptoms should not remain in the waiting room but should be taken immediately to an examination room and the door should remain closed.
- If the patient must be transported to a hospital by ambulance, the hospital emergency room and the ambulance transport service should be notified of the possible SARS diagnosis and instructed to take the appropriate infection control precautions.
- To facilitate contact tracing of exposed employees, the local health department should be notified of all suspected cases of SARS.

Personal Protective Equipment (PPE)

- Healthcare workers assigned to outpatient clinic or physician's offices should have immediate access to personal protective equipment including gowns, gloves, respirators, masks and eye protectors or face shields.
- Healthcare workers should wear disposable, long sleeve gowns when direct face-to-face contact with a SARS infected person is anticipated.
- Disposable, non-sterile gloves should be worn when contact with respiratory secretions, blood and other body fluids are anticipated. Gloves are **not** a substitute for hand washing. Gloves should be put on immediately before patient contact and removed when physical contact with the patient is no longer necessary. Gloves should be changed between each patient.
- Hands should be washed with soap (plain or antimicrobial) and water after contact with all patients and environmental surfaces in close proximity to the patient. If hands are not visibly soiled with respiratory secretions, blood or other body fluids, an alcohol-based hand hygiene product can be used. For maximum effectiveness follow the instructions on the product label.
- Healthcare workers should be instructed not to touch the mucous membranes of the nose, eye or mouth with unwashed hands.

- An N-95 filtering disposable respirator should be worn when entering the room of a suspected SARS patient. When N-95 respirators are not available, healthcare workers evaluating and caring for suspect SARS patients should wear a surgical mask.
- Eye protectors (eye shields or goggles) should be worn when in direct face-to-face contact with a coughing patient.

Patient Care Equipment

- Reusable examination equipment such as stethoscopes and blood pressure cuffs and should be disinfected with a properly diluted, FDA approved, germicidal solution after use on a SARS patient.
- Environmental surfaces should be disinfected with a properly diluted FDA-approved disinfectant after the patient leaves the examination room and before admitting another patient to that room.
- Disposable examination gowns and sheets should be placed in a plastic leak-proof bag and disposed of as regular waste.
- Reusable examination gowns, sheets and lab coats should be placed in leak-proof laundry bags and be laundered with warm water and any commercial detergent.

Patients/Family Instructions

- Patient and family members should be informed about SARS and how it is transmitted. If the patient is discharged to home, instructions have been developed for caring for the patient in the home (*See Infection Control Recommendations in the Home Setting*).
- Family members should be instructed to seek medical evaluation if they develop a fever and a cough or other respiratory symptoms.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES SEVERE ACUTE RESPIRATORY SYNDROME (SARS) INFECTION CONTROL RECOMMENDATIONS OCCUPATIONAL EXPOSURE

Healthcare workers (HCW) who may be exposed to patients with SARS should be closely monitored for symptoms (fever or respiratory symptoms) of infection. To date there is no evidence that SARS can be transmitted from an asymptomatic person. However, there are a number of recent reports that healthcare workers in the early phase (onset of fever) of the infection may be a source of transmission to other healthcare workers, patients, family members and the community. To minimize the risk of SARS transmission from mildly symptomatic healthcare workers, it is imperative that hospital infection control committees develop, implement and enforce procedures, not only to protect the work force but also to protect the community.

The Centers for Disease Control and Prevention (CDC) has published revised *Interim Domestic Guidance for Management of Exposures to Severe Acute Respiratory Syndrome (SARS) for Health-Care Settings* on May 20, 2003. (See www.cdc.gov/ncidod/sars/exposureguidance.htm). The California Department of Health Services (CDHS), Division of Communicable Disease Control has issued additional recommendations to provide an extra margin of protection.

Exposure Surveillance

Infection control practitioners should develop a system to identify healthcare workers who may have protected or unprotected exposure to a suspected or probable SARS case. The system should be able to:

- Identify healthcare workers who may be exposed to a SARS case in any area of the hospital including the emergency department and outpatient clinic settings.
- Notify administrators, managers and supervisors that a SARS patient has been admitted to the hospital, emergency department or outpatient clinic setting.
- Monitor healthcare worker absenteeism for increases that may be suggestive of respiratory illness.
- Notify the local health department within 24 hours of any healthcare worker's illness or any increase in hospital admissions related to respiratory illness.

Unprotected High-Risk Exposure

An unprotected high-risk exposure is defined as failure to wear personal protective equipment while in the same room as a suspected or probable SARS patient who is having a coughing paroxysm or who is receiving a high-risk aerosol-generating procedure. Personal protective equipment includes appropriate respiratory protection, gowns, gloves, eye protectors (goggles), head and neck protection and face shields (See *Infection Control Recommendations – Hospitalized Patients*).

High-risk aerosol-generating procedures include, but are not be limited to:

- Aerosolized medication treatments,

- Diagnostic sputum induction,
- Bronchoscopy,
- Endotracheal intubation,
- Airway suctioning,
- Positive pressure ventilation by facemask,
- High frequency oscillatory ventilation (HFOV) (e.g., BiPAP, CPAP),
- Close face to face contact during a coughing paroxysm, and
- Cardiopulmonary resuscitation.

Management of Healthcare Workers High-Risk Exposure

To minimize the potential for transmission following a high-risk exposure healthcare workers should:

- Immediately (as soon as possible after the exposure but no later than the end of the work shift) report the unprotected high-risk exposure event to the infection control, occupational health practitioner or designee.
- Be counseled about SARS symptoms, incubation period, transmission, treatment, and home isolation recommendations.
- Be placed on administrative leave for 10 days after the last date of exposure.
- Follow home isolation recommendations.
- Be required to take their temperature twice daily (AM and PM) and record the readings for 10 days after the last date of exposure.
- Be interviewed daily by telephone to assess for evolving symptoms.
- Be required to report any symptoms (e.g., fever, chills, cough, diarrhea, myalgias, etc.) to the infection control, occupational health or designee.
- Seek immediate medical evaluation if symptoms develop.
- Place a mask over their nose and mouth while in the presence of asymptomatic persons.
- Notify the physician's office prior to reporting for clinical evaluation.

If fever or respiratory symptoms do not develop while on the 10-day administrative leave, the healthcare worker should be medically evaluated before being cleared to return to work. If fever or respiratory symptoms develop the hospital should follow the recommendations for returning to work below.

Unprotected Moderate-Risk Exposure

An unprotected moderate-risk exposure is defined as failure to follow infection control recommendations, including respiratory protection, while in the same room as a suspected or probable SARS case who is not having an aerosol-generating procedure or who is not coughing (See *Infection Control Recommendations – Hospitalized Patients*).

Management of Moderate-Risk Exposure

To minimize the potential for transmission following a moderate-risk exposure event healthcare workers should:

- Report the exposure to infection control, occupational health or designee as soon as possible but no later than the end of the shift on the exposure day.
- Be counseled about SARS symptoms, incubation period, transmission, treatment, and home isolation recommendations.
- Report to infection control, employee health or designee each day before beginning work for surveillance of symptoms (fever or cough) for 10 days after the last date of exposure.
- Take and record their temperature one additional time daily for 10 days after the last exposure date.
- Stay at home if fever or respiratory symptoms develop.
- Report symptoms by telephone to infection control, employee health or designee immediately.
- Leave assigned work area if symptoms begin while at work.
- Place a mask over the nose and mouth if fever or cough develops.
- Follow home isolation recommendations.
- Notify physician or clinic prior to reporting for an appointment.

Protected Exposure

A protected exposure is defined as being in full compliance with SARS infection control recommendations, including respiratory protection, while in the same room as a suspected or probable SARS case.

Management of Protected Exposure

To minimize the potential for transmission following a protected exposure event the healthcare worker should:

- Maintain a record of each exposure including the name of the patient, date, time and place exposure occurred, and any unusual problems associated with the exposure.
- Be counseled about SARS symptoms, incubation period, transmission, treatment, and home isolation recommendations.
- Take and record their temperature each morning and evening for 10 days after the last exposure date.
- Report fever or cough to infection control, employee health or designee.
- Leave assigned work area if illness occurs during the work shift.
- Place a surgical mask over the nose and mouth if fever or cough develops.
- Follow home isolation recommendations.
- Notify physician or clinic prior to reporting for an appointment.

Returning to Work

To minimize the possibility that a SARS infected healthcare worker may be a source of transmission the following recommendations have been developed to assist infection control committees in determining return to work policies.

- A. If fever **and** respiratory symptoms (meets current SARS case definition) develop within 10 days following an exposure to a suspected or probable case:
1. Notify the infection control, occupational health practitioner or designee.
 2. Notify the local health department.
 3. Refer healthcare worker to appropriate physician consultant for medical evaluation and diagnostic testing for SARS-coronavirus.
 4. Place the healthcare worker on home isolation for 10 days after the onset of the first symptom, if hospitalization is not required.
 5. If fever and respiratory symptoms persist, home isolation should be continued for 10 days after fever has resolved and respiratory symptoms are either absent or improved.
 6. If fever resolves, but respiratory symptoms have not improved within the 10-day period, the healthcare worker should remain on home isolation until clinically improved.
 7. The healthcare worker should be medically evaluated and cleared to return to work by the local health department in consultation with the staff infectious disease physician and the infection control or occupational health practitioner.
- B. If fever **or** respiratory symptoms (does not meet SARS case definition) develop within 10 days following an exposure to a suspected or probable case:
1. Place the healthcare worker on home isolation for 72 hours. If fever and respiratory symptoms resolve, home isolation can be discontinued.
 2. If fever persists or respiratory symptoms do not resolve within the first 72 hours, refer the healthcare worker for medical evaluation and diagnostic testing for SARS-coronavirus.
 3. Continue home isolation for an additional 72 hours.
 4. The healthcare worker should be medically evaluated and cleared to return to work by the local health department in consultation with the staff infectious disease physician and the hospital infection control or occupational health practitioner.
 5. If symptoms progress to meet the SARS case definition, follow the recommendations in A above.

Home Isolation

Many persons with SARS symptoms may not require hospitalization but may be able to transmit the infection to co-workers, household members and friends as well as other healthy persons in the community. In California, a Model Home Isolation Agreement has been developed and may be issued by the local health department to persons with suspected or probable SARS (see Model Home Isolation Agreement). Healthcare workers should be given a copy of the CDHS/DCDC *Infection Control Recommendations- Home Settings* if they are placed on home isolation and informed that local public health department may contact them for further information.

SARS Healthcare Worker Occupational Exposure Summary			
HCW Education and Training	Unprotected high-risk exposure	Unprotected moderate-risk exposure	Protected exposure
<u>Airborne Isolation Room, HEPA filter</u> <u>Personal Protective Equipment (PPE)</u> Respiratory protection and alternative devices Fit-testing and fit-checking Gown, gloves, goggles, face shield, head and neck covering Hand hygiene High risk procedures Exposure reporting Monitor visitors Environmental disinfection Competency evaluation <u>Disease</u> Case definition Epidemiology Transmission Symptoms Treatment <u>Suspected or probable cases</u> Home isolation Local health department reporting <u>Exposed HCW</u> Exposure line listing Monitor sick calls Medical evaluation Symptoms screening Return from SARS affected area	<i>Infection control recommendations (PPE) absent or breached and HCW exposed to suspect or probable SARS-infected patient during aerosol-generating procedure or coughing patient</i> Report unprotected high-risk exposure event to supervisor and infection control or occupational health practitioner. Counseled SARS symptoms Place on administrative leave for 10 days after last date of exposure Follow home isolation recommendations Monitor temperature twice daily for 10 days Interview daily by telephone to assess HCW evolving symptoms Report symptoms Medical evaluation Place surgical mask over nose and mouth Notify MD office or clinic by phone before entering office	<i>Infection control recommendations (PPE) absent or breached and HCW not exposed to suspect or probable SARS-infected patient during aerosol-generating procedure or coughing patient</i> Maintain record of each exposure Report exposure Report for symptoms surveillance prior to work each day for 10 days Take and record temperature one additional time daily for 10 days Stay home if fever or cough develop Report symptoms Leave assigned work area if feeling ill Place mask over nose and mouth if fever or cough develops Follow home isolation recommendations Medical evaluation Notify MD or clinic of symptoms before entering office	<i>Infection control recommendations (PPE) followed and HCW exposed to suspect or probable SARS patient</i> Maintain a record of each exposure Report exposure For 10 days after exposure date(s), take and record temperature twice each day Report fever or respiratory symptoms Stay at home if fever or cough develop Leave assigned work area immediately if feeling ill Place mask over nose and mouth if fever or cough develops Follow home isolation recommendations Medical evaluation Notify MD or clinic of symptoms before entering office

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
HEALTHCARE WORKER (HCW) EXPOSURE CONTACT TRACING FORM**

Date of Report: ____/____/____ HCW Name: _____

Date of Birth: ____/____/____ Sex: ____ Home Address: _____

City: _____ Zip Code: _____ Telephone #: (____) _____

Nursing unit/department/service where HCW routinely works: _____

Date(s) of SARS Exposure: ____/____/____

Place(s) of SARS Exposure (ED, ICU, etc.): _____ Unknown **YES NO**

Name of SARS Patient HCW exposed to, if known: _____

Did the SARS patient have CXR documented pneumonia? **YES NO**

Was the SARS patient admitted to the hospital? **YES NO** If yes, what nursing unit? _____

Date and time SARS patient placed in airborne isolation: ____/____/____ Time: ____ AM/PM

Did HCW self-report exposure? **YES NO**

If yes, date reported: ____/____/____ Time reported: _____ AM/PM

Did HCW have unprotected high-risk occupational exposure? **YES NO**

If yes, date HCW placed on 10-day administrative leave? ____/____/____

Did HCW have unprotected moderate-risk occupational exposure: **YES NO**

Date reported? ____/____/____

Did HCW have protected low-risk occupational exposure? **YES NO**

Date reported? ____/____/____

Did HCW develop SARS-related symptoms? **YES NO**

If yes, date HCW developed symptoms? ____/____/____

Was HCW hospitalized? **YES NO** If yes, date admitted? ____/____/____

Was HCW placed on home isolation? **YES NO** Date home isolation? ____/____/____

Were laboratory specimens for SARS sent to local health department? **YES NO**

Date specimens sent to local health department: ____/____/____

HCW a suspected SARS case? **YES NO** A probable case? **YES NO**

Over the past 10 days, has HCW had any of the following symptoms? (Check all that apply).

Symptoms	Yes	Date Onset	Symptoms	Yes	Date Onset
Fever			Trouble breathing		
Shaking chills			Diarrhea		
Headache			Very tired		
Dry cough			Sore muscles		

Unprotected Moderate-Risk Exposure and Protected Exposure Daily Temperature Log

For 10 days after the last date of exposure record all temperature readings each AM and PM and prior to reporting to work each day.

Day	Date	Time Taken		Recording	Comments	Temperature at Work	
		AM	PM			Time	Recording
Day 1							
Day 2							
Day 3							
Day 4							
Day 5							
Day 6							
Day 7							
Day 8							
Day 9							
Day 10							

Other Information

CALIFORNIA DEPARTMENT OF HEALTH SERVICES SEVERE ACUTE RESPIRATORY SYNDROME (SARS) INFECTION CONTROL RECOMMENDATIONS HEALTHCARE WORKER TRAVEL TO SARS AFFECTED AREA

The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have issued advisories for people planning travel to geographical areas of world affected by severe acute respiratory syndrome (SARS). These travel advisories are temporary and are reevaluated as the number of cases decrease and transmission within these countries is contained. Other countries may be added at the discretion of CDC or WHO. For up to date information about travel restrictions and recommendations, healthcare workers and their household members planning to travel to SARS-affected areas should consult the CDC web site (www.cdc.gov) or the WHO web site (www.who.int).

To date, most of the reported cases of SARS in the United States have been acquired during international travel to places where transmission has occurred in the community. Healthcare workers should consult with their employer (supervisor, infection control or occupational health practitioner) before traveling and should be advised that they will be monitored for SARS-related symptoms upon return. At this time the CDC does not advise restricting healthcare workers from work, school or other out of the home activities unless fever **or** respiratory symptoms develop within 10 days after (1) the date of return from a SARS-affected area, or (2) an exposure to a symptomatic close contact.

Hospital infection control committees should review recommendations published by California Department of Health Services (CDHS), Division of Communicable Disease Control (DCDC) and the CDC and develop return-to-work policies applicable to all facility personnel including, but not limited to, physicians, nurses, contract personnel, ancillary personnel, volunteers and students.

Current Case Definition

The CDC has developed a case definition for suspect and probable SARS. As more information about the epidemiology and transmission of SARS becomes available, the case definition may be changed. Healthcare workers should consult the CDC web site (www.cdc.gov/sars) for the most current definition.

SARS Transmission

The primary mode of transmission is most likely close person-to-person contact with an infected person who sprays infectious respiratory droplets into the air when coughing or sneezing. Infectious droplets do not ordinarily travel in the air beyond 3 feet; therefore it appears at this time that close contact with an infected person is necessary for transmission to occur. Other potential modes of transmission include contact with the infected person's skin or environmental objects that have been contaminated by respiratory secretions, blood or other body fluids (feces, urine, vomitus, etc.) and then transmitted to a non-infected

person when the eyes, nose or mouth are touched with unwashed hands or contaminated gloves. It is possible that SARS may also be airborne and can contaminate persons and environmental objects beyond the droplet range.

Before Traveling

Before traveling to a SARS-affected area healthcare workers should inform their employer of travel plans and review the return-to-work policy developed by the hospital's infection control committee.

Additionally healthcare workers should consider taking the following basic medical supplies including:

- Hand soap; disposable, individually packaged hand hygiene towelettes; and an alcohol-based hand hygiene product,
- Disposable thermometer,
- Container of household bleach (secured in zip-lock bags),
- Disposable gloves,
- Surgical masks, and
- Disposable tissues (Kleenex).

Other things that should be considered before traveling include:

- Check with the local health department for recommended immunizations at least 4 - 6 weeks prior to travel.
- Identify a healthcare practitioner or facility in designated cities in case medical attention is needed.
- Identify the addresses and telephone numbers of the nearest U.S. Embassy or Consular Office in all countries on your itinerary.
- Review health insurance plans and apply for additional medical evacuation coverage, if applicable. Information about medical evacuation can be found on the U.S. State Department web page.

While traveling

- Hands should be washed with soap and water or decontaminated with an alcohol-based hand hygiene product frequently when traveling.
- Crowded areas should be avoided to the extent possible. The CDC does not recommend the routine use of surgical masks or gloves when in public areas.

If Symptoms Develop

- Long distance travel (air, train, bus, etc.) should be deferred until fever and respiratory symptoms are improving.
- The U.S. Embassy or Consular Office should be contacted for a list of recommended healthcare providers.

- Local healthcare providers should be informed of fever and respiratory symptoms prior to going to a physician's office, clinic or emergency department.
- The nose and mouth should be covered with a disposable tissue when coughing or sneezing.
- A mask should be worn over the nose and mouth when entering public areas such as hotel lobbies and when in close contact with healthy persons or taking local public transportation (e.g., taxi, bus, etc.). The mask should be changed if it becomes moist or damaged and disposed of in a waste receptacle lined with paper or plastic. If unable to wear a mask, other persons in close proximity (e.g., same room, taxi, etc.) should wear a mask.
- Family members should wear disposable gloves when in contact with respiratory secretions (lung, nasal, etc.), blood or other body fluids (feces, urine, vomitus, etc.) is necessary. Gloves should be deposited in a plastic or paper-lined waste receptacle and not washed or reused.
- Family members and ill persons should wash their hands after contact with respiratory secretions, blood and other body fluids. Hands should be washed after removing gloves. An alcohol-based hand hygiene product can be used if hands are not visibly soiled with respiratory secretions, blood or other body fluids.
- Towels, clothes and bedding and eating utensils should not be shared.
- Sharing a bed with a non-infected person should be avoided, if possible.
- The bathroom sink, toilet and other environmental surfaces should be disinfected daily and when soiled with respiratory secretions, blood or other body fluids with a diluted bleach solution (1 part bleach to 99 parts water). Gloves should be worn.
- Close contacts staying with the sick person do not need to restrict activities unless they develop fever or respiratory symptoms.

Returning to Work

There is no evidence at present that SARS is transmitted by asymptomatic persons. However, according to recent reports, healthcare workers who develop SARS may be a source of transmission within the healthcare facility or community during the early phase of the infection when symptoms are mild. To minimize the possibility that healthcare workers may be a source of transmission, the following recommendations have been developed to assist hospital infection control committees in determining return to work after travel to SARS-affected area policies.

Healthcare workers should be instructed to monitor their temperature twice a day (AM and PM) beginning on the day of travel return. If fever or cough develops healthcare workers should not report to work. Prior to reporting to work, healthcare workers should inform their supervisor and the infection control or occupational health practitioner or designee of their return from a SARS-affected area and that they are currently asymptomatic.

For 10 days after the date of return from travel, healthcare workers should:

- Be interviewed and physically assessed for respiratory symptoms and have their temperature taken prior to reporting to work each day for 10 days after the date of return.
- In addition to having their temperature taken prior to reporting to work, monitor and record their temperature at least one other time daily.
- Be informed that if they develop fever or cough they should stay home and immediately report the symptoms to a supervisor and the infection control or occupational health practitioner or designee by telephone.
- Place a surgical mask over their nose and mouth and leave the work area immediately if fever or respiratory symptoms develop while at work.
- Be medically evaluated as soon as possible after onset of symptoms.
- Alert their health care provider by telephone so that appropriate isolation measures can be taken to protect office, clinic or emergency department healthcare workers.

The following information may assist infection control committees in developing a return to work policy for healthcare workers who become symptomatic for SARS following return from an affected area.

A. If fever **and** respiratory symptoms (meets current SARS case definition) develop:

- (1) within 10 days after the date of return, or
- (2) within 10 days following an exposure to a suspected or probable case.
 - (a) Notify the infection control or occupational health practitioner or designee.
 - (b) Notify the local health department.
 - (c) Refer the healthcare worker to an appropriate physician consultant for medical evaluation and diagnostic testing for SARS-coronavirus.
 - (d) Place the healthcare worker on home isolation for 10 days after the onset of the first symptom, if hospitalization is not required.
 - (e) If fever and respiratory symptoms persist, home isolation should be continued for 10 days after fever has resolved and respiratory symptoms are either absent or improved.
 - (f) If fever resolves, but respiratory symptoms have not improved within the 10-day period, the healthcare worker should remain on home isolation until clinically improved.
 - (g) The healthcare worker should be medically evaluated and cleared to return to work by the local health department in consultation with the staff infectious disease physician and the infection control or occupational health practitioner.

B. If fever **or** respiratory symptoms (does not meet SARS case definition) develop:

- (1) within 10 days after the date of return, or
- (2) within 10 days following an exposure to a suspected or probable case.
 - (a) Place the healthcare worker on home isolation for 72 hours. If fever and respiratory symptoms resolve, home isolation can be discontinued.
 - (b) If fever persists or respiratory symptoms do not resolve within the first 72 hours, refer the healthcare worker for medical evaluation and diagnostic testing for SARS-coronavirus.
 - (c) Continue home isolation for an additional 72 hours.
 - (d) When symptoms have resolved, the healthcare worker should be medically evaluated and cleared to return to work by the local health department in consultation with the staff infectious physician and the infection control or occupational health practitioner.
 - (e) If symptoms progress to meet the case definition, follow the recommendations in A above.

Home Isolation

Many persons with SARS symptoms may not require hospitalization but may be able to transmit the infection to co-workers, household members and friends as well as other healthy persons in public areas. In California, a Model Home Isolation Agreement has been developed and may be issued by the local health department to persons with suspected or probable SARS (see *Model Home Isolation Agreement*). Healthcare workers should be given a copy of the CDHS/DCDC *Infection Control Recommendations- Home Settings* if they are placed on home isolation and informed that local public health departments may contact them for further information.

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
INFECTION CONTROL RECOMMENDATIONS
LABORATORY SPECIMEN COLLECTION**

The following procedures are based on the performance of testing for SARS (viral culture, serology and/or polymerase chain reaction [PCR]) at the California Department of Health Services (CDHS), Viral and Rickettsial Disease Laboratory (VRDL) in Richmond, California. Laboratory testing may be available in local health department laboratories that belong to the Laboratory Response Network (LRN) in the future and these procedures may be subject to change at that time.

General Instructions, Specimen Form, and SARS Case Report Form

It is important that requests for laboratory testing for SARS be coordinated among providers in the healthcare setting where the specimens are collected (hospitals, clinics and physician offices), the local health department, and the CDHS Infectious Diseases Branch (IDB). Healthcare providers must first discuss cases that are candidates for testing with the local health department. If the local health department agrees to pursue testing, the case will then be discussed with staff at IDB. Before laboratory testing is performed a SARS Case Report Form (See SARS Case Definition Report) must be submitted to IDB by the local health department. This form identifies the patient as a suspected or probable SARS case (e.g., meets the case definition). If the case definition is not met or if the form is not complete, the specimens may not be processed or may be processed at a later time. The procedures for completing the case definition report form and submitting specimens will vary with each local health department. Some departments may request that hospital or clinic personnel complete the form while others may assume the responsibility and complete the form by telephone or electronically.

Laboratory managers should develop and implement a procedure to coordinate collecting, holding, submitting and transporting specimens as directed by the local health department. Specimens will generally be sent directly from the hospital, clinic or physician's office to VRDL in Richmond unless specifically requested to do otherwise by the local health department. Specimens should not be sent to the Centers for Disease Control and Prevention (CDC).

Note: All specimens except blood and tissue should be placed in viral transport medium (VTM). Do not send specimens to VRDL on Fridays, weekends or holidays unless specifically requested to do so. If specimens from patients are collected on these days they should be refrigerated and sent to the local health department on the next business day.

Respiratory Specimens

Upper and lower respiratory tract specimens should be collected as soon as possible after the onset of the illness. The likelihood of recovering most viruses diminishes markedly if more than 7 days have elapsed after the onset of symptoms.

Upper Respiratory Tract Specimens**Nasopharyngeal (NP) and Oropharyngeal Swabs**

Required: Acute - Two (2) nasopharyngeal NP swabs collected within 7 days after the onset of fever.

Recommended: Convalescent - One (1) NP swab each collected at 14 days and 28 days after onset of fever.

Procedure

Use only sterile dacron or rayon swabs with plastic shafts. Do **NOT** use calcium alginate swabs or swabs with wooden sticks, as they may contain substances that inactivate some viruses and inhibit PCR testing. Place swabs immediately into sterile vials containing 2 ml of viral transport media. Break the applicator sticks off near the top of the container to permit tightening of the cap.

Nasopharyngeal swabs

Insert swab into nostril parallel to the palate and leave in place for a few seconds to absorb secretions. Swab both nostrils.

Oropharyngeal swabs

Swab both posterior pharynx and tonsillar areas, avoiding the tongue.

Nasopharyngeal wash/aspirates

NP washes/aspirates are the specimens of choice for detection of respiratory viruses and are the preferred collection method among children less than two (2) years of age. They are not required by CDHS but may be required if specimens are forwarded to CDC.

Procedure

The patient should sit with the head tilted slightly backwards,
Flush a plastic catheter or tubing with 2 - 3 ml of nonbacteriostatic saline (pH 7.0),
Insert the tubing into the nostril parallel to the palate,
Instill 1 - 1.5 ml of nonbacteriostatic saline (pH 7.0) into one nostril,
Aspirate nasopharyngeal secretions,
Repeat this procedure for the other nostril, and
Collect specimens in sterile vials.

Lower Respiratory Tract Specimens (Recommended by CDHS, if available):

Bronchoalveolar lavage, tracheal aspirate, and pleural tap

Procedure

If any of these specimens are collected, one half of each specimen should be centrifuged and the cell-pellet fixed in formalin. The remaining unspun fluid should be placed in sterile vials with external caps and internal O-ring seals. If there are no internal O-ring seals, then cap securely and seal with parafilm.

Serum Specimens

Required: Acute Serum - At least 3 cc of serum collected 7 or fewer days after onset of fever.

Required: Convalescent Serum - At least 3 cc of serum collected at 14 days and a second no sooner than 28 days (not 21 days) after the onset of fever.

Procedure: Adults - a minimum of 200 microliters of serum is preferred for each test and can easily be obtained from 5ml of whole blood. Collect 5-10 ml of whole blood in a serum separator tube. Allow blood to clot.

Procedure: Pediatric - a minimum of 1 cc of whole blood is needed for testing. If possible, collect 1cc in both an EDTA and a clotting tube. However, if only 1 cc can be obtained, use a clotting tube for collection.

Centrifuge blood briefly and collect all resulting sera in vials with external caps and internal O-ring seals. If there are no internal O-ring seals, then cap securely and seal with parafilm.

EDTA Blood - Collect 5-10 ml of whole blood in an EDTA (purple-top) tube. Transfer to vials with external caps and internal O-ring seals. If there are no internal O-ring seals, then cap securely and seal with parafilm.

Stool and Urine

For hospitalized patients who after consultation with the Infectious Diseases Branch are considered highly suspicious for SARS, two (2) samples each in the first 2 weeks (early in the course of infection, if possible; rectal swab may be substituted if stool is unavailable):

Recommended, if available - Stool (10 - 50 cc) should be placed in a stool cup or urine container, Urine (10 - 50 cc) should be placed in a urine container, capped securely, sealed with parafilm and bagged.

Tissue specimens (for deceased patients)**Procedure**

Fixed tissues (formalin fixed or paraffin embedded) from all major organs (e.g., lung, trachea, heart, spleen, liver, brain, kidney, adrenals) are acceptable. Formalin fixed tissue is not considered a hazard. Fixed tissue should be stored and shipped at room temperature. DO NOT FREEZE FIXED TISSUES.

Fresh frozen tissues from lung and upper airway (e.g., trachea, bronchus) should be collected aseptically as soon as possible after death. Technique and time will impact risk of post-mortem contamination. Use separate sterile instrument for each collection site. Place each specimen in separate sterile containers containing small amounts of viral transport media or saline. Store and ship frozen on dry ice.

Identification

Each specimen container should be labeled with the patient's name, medical record number, date of collection, identification of specimen, attending physician's name, and the hospital's name, address and telephone number.

Packaging and Transportation

Hospitals, clinics and physician offices should follow the instructions provided by the local health department for packaging and shipping specimens. Clinical laboratory personnel should verify the packaging and shipping procedures with their local health department.

Respiratory, blood and fecal specimens should be packaged with cold packs to maintain the temperature at 4°C during shipping. Formalin-fixed specimens can be shipped without a cold pack. Fresh frozen specimens should be shipped on dry ice.

Recommended Specimens for SARS Testing

Outpatient	Inpatient	Deceased
<u>Upper respiratory</u> Required - 2 NP cultures within 7 days of onset of fever; Recommended - 1NP culture greater than 28 days after onset of fever <u>Blood</u> Required - Acute Serum - (within 7 days after onset of fever) Required - Convalescent Serum (at least 28 days after onset of fever) <u>Stool</u> Recommended	<u>Upper Respiratory</u> Required - 2 NP cultures within 7 days of onset of fever; Recommended - 1NP culture at 14 days and 1 at greater than 28 days after onset of fever <u>Lower Respiratory</u> Bronchoalveolar lavage (BAL), tracheal aspirate, or pleural tap, if available <u>Blood</u> Required - Acute Serum - (within 7 days after onset of fever) Required - Convalescent Serum (at least 28 days after onset of fever) <u>Stool and Urine</u> Recommended	<u>Tissue</u> Fixed tissue from all major organs (e.g., lung, heart, spleen, liver, brain, kidney, adrenals) <u>Frozen Tissue</u> Lung and upper airway (e.g., trachea, bronchus) <u>Upper Respiratory</u> NP aspirate or NP swabs <u>Lower Respiratory</u> Bronchoalveolar lavage (BAL) Tracheal aspirate or pleural tap <u>Blood</u> Serum Whole blood <u>Stool</u> Recommended

SARS SPECIMEN SUBMISSION FORM

revised 6/12/2003

Viral and Rickettsial Disease Laboratory
850 Marina Bay Parkway, Richmond, CA 94804

phone (510) 307-8575
fax (510) 307-8599

The local public health department MUST be notified of this case prior to submission of samples. The local public health department may be able to assist with specimen transport.

Specimens will be accepted from cases meeting the CDC criteria for suspect or probable SARS. The case definition for SARS is updated frequently and can be found at the CDC website at <http://www.cdc.gov/ncidod/sars/casedefinition.htm>. Please contact your local public health department if there is any question of whether a patient meets the case definition.

Instructions for Sending Specimens

- ☐ Each specimen should be labeled with date of collection, specimen type, and patient name.
- ☐ Send specimens on cold pack to either your local public health laboratory or:

Department of Health Services
Specimen Receiving / SARS
850 Marina Bay Parkway
Richmond, CA 94804

- ☐ Please do not send specimens on a Friday unless they can be hand-carried directly to the laboratory. Refrigerate specimens over the weekend and send on Monday. Specimens should be sent using an overnight courier if possible.

Summary of Specimens Requirements	
<u>Acute – Required:</u> <input type="checkbox"/> 2 NP swabs in Viral Transport Medium (VTM) <input type="checkbox"/> >3 ml serum (red top or serum separator tube) <input type="checkbox"/> 5-10 ml whole blood in EDTA (purple top)	<u>Convalescent (≥28 days) – Required:</u> <input type="checkbox"/> >3 ml serum (red top or serum separator tube)
<u>Acute – Recommended:</u> <input type="checkbox"/> ET aspirate (if intubated), BAL or pleural tap <input type="checkbox"/> Stool and Urine sample	<u>Convalescent (≥28 days) – Recommended:</u> <input type="checkbox"/> 1 NP swab in Viral Transport Medium (VTM)

IMPORTANT: please complete the form below and submit with specimens

Patient's last name, first name			County of residence:	Route to: [] _____ [] _____ [] _____ [] _____	
Age or DOB:	Sex (circle): M F	Onset Date:	Hospital/clinic laboratory where specimens collected:		
Disease suspected or test requested: Severe Acute Respiratory Syndrome (SARS)			<i>This section for VRDL use only.</i> <i>Date received by VRDL and State Accession Number</i>		
1 st	Specimen type and/or specimen source	Date Collected			1 st
2 nd	Specimen type and/or specimen source	Date Collected			2 nd
3 rd	Specimen type and/or specimen source	Date Collected		3 rd	
4 th	Specimen type and/or specimen source	Date Collected	4 th		

Questions related to specimens? Call David Cottam at (510) 307-8585

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
INFECTION CONTROL RECOMMENDATIONS
LABORATORY BIOSAFETY**

Severe Acute Respiratory Syndrome (SARS) is a respiratory illness that has recently been reported in Asia, Canada and in the United States and is being investigated by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). The illness is characterized by fever and respiratory symptoms 2 -10 days after exposure and is caused by the SARS-associated coronavirus (SARS-CoV). To date in the United States only 8 cases of laboratory confirmed SARS has been identified from approximately 63 probable cases and 265 suspect cases (See www.cdc.gov/ncidod/sars for current case definition and a daily update on the number of cases in the U.S. and the world).

Current Case Definition

The CDC has developed a case definition for SARS. As more information about the epidemiology and transmission of SARS becomes available, the case definition may be changed. Healthcare workers should consult the CDC web site (www.cdc.gov/ncidod/sars) for the most current definition.

SARS Transmission

The primary mode of transmission is most likely close person-to-person contact with an infected person who sprays infectious respiratory droplets into the air when coughing or sneezing. Infectious droplets do not ordinarily travel in the air beyond 3 feet; therefore it appears at this time that close contact with an infected person is necessary for transmission to occur. Other potential modes of transmission include contact with the infected person's skin or environmental objects that have been contaminated by respiratory secretions, blood or other body fluids (feces, urine, vomitus, etc.). The virus can then be transmitted to a non-infected person when the eyes, nose or mouth are touched with unwashed hands or contaminated gloves. It is possible that SARS may also be airborne and can contaminate persons and environmental objects beyond the droplet range.

Laboratory Safety

It is estimated that several thousand diagnostic specimens from patients with SARS have been processed in routine clinical laboratories throughout the world and to date there have been no reported clusters of SARS illness among laboratory workers. Nonetheless, until more information about the transmission of the SARS agent in the laboratory setting is known, reasonable precautions should be taken in handling these specimens. Effective and timely communication between clinical and laboratory staff is essential in minimizing the risk incurred in handling specimens from patients in whom SARS is suspected. Specimens from patients with suspected SARS should be labeled accordingly and the laboratory should be alerted to insure proper specimen handling. Listed below are interim biosafety guidelines for handling

these specimens. A detailed description of recommended facilities, practices, and protective equipment for the various laboratory biosafety levels (BSL) given below may be found in the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories manual (BMBL) (full text available at www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4s3.htm).

Any procedure with the potential to generate fine particulate aerosols (e.g., vortexing or sonication of specimens in an open tube) should be performed in a biological safety cabinet (BSC). The use of sealed centrifuge rotors or sample cups, if available, should be employed for centrifugation. Ideally, these rotors or cups should be unloaded in a BSC.

Procedures performed outside of a BSC should be performed in a manner that minimizes the risk of exposure to an accidental sample release. Work surfaces and equipment should be decontaminated after specimens are processed. Standard decontamination agents that are effective against lipid-enveloped viruses should be sufficient. If the safety equipment described above is not available, administrative measures and/or additional personal protective equipment may be employed to reduce the risk. For example, the workflow of the laboratory may be adjusted so that a minimum number of workers are present during centrifugation. Consideration may be given to implementing a respiratory protection program for workers to use during centrifugation or other procedures with increased potential for accidental sample release. Acceptable methods of respiratory protection include a properly fit tested NIOSH approved filter respirator (N95 or higher); or powered air-purifying respirators (PAPRs) equipped with high efficiency particulate air (HEPA) filters. Accurate fit testing is a key component of effective respirator use. Personnel who cannot wear fitted respirators because of facial hair or other fit-limitations should wear loose fitting hooded or helmeted PAPRs. Consideration may also be given to referral of specimens to a suitably equipped reference laboratory. The facility infection control or occupational health practitioner should be contacted for further information about the respiratory protection program.

Blood and Urine Specimens

These specimens may be handled using Standard Precautions (previously Universal Precautions) in BSL-2 laboratories. Laboratory workers should wear protective equipment, including disposable gloves, laboratory coats, eye protection and a surgical mask, or face shield. Specimen container lids should be removed under a plastic shield or other barrier such as a safety cabinet to prevent splashing or spraying of the contents onto personal protective equipment and environmental surfaces. Careful attention should be given to hand hygiene after removal of gloves and especially before touching the eyes or mucosal surfaces.

Other Specimens

The following activities may be performed in BSL-2 facilities with standard BSL-2 work practices:

- Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues.
- Molecular analysis of extracted nucleic acid preparations.
- Electron microscopic studies with glutaraldehyde-fixed grids.
- Routine examination of bacterial and mycotic cultures.
- Routine staining and microscopic analysis of fixed smears.
- Final packaging of specimens for transport to diagnostic laboratories for additional testing. Specimens should already be in a sealed, decontaminated primary container.

Activities involving manipulation of untreated specimens may be performed in BSL-2 facilities, but with more stringent BSL-3 work practices. Laboratory workers should wear protective equipment, including disposable gloves, solid front gowns with cuffed sleeves, and full face and eye protection. Specimen manipulations should be carried out in a certified biological safety cabinet. When a procedure or process cannot be conducted within a biological safety cabinet, then appropriate combinations of personal protective equipment (e.g., respirators, face shields) and physical containment devices (e.g., centrifuge safety cups or sealed rotors) must be used. Examples of these activities include:

- Aliquoting and/or diluting specimens.
- Inoculation of bacterial or mycological culture media.
- Performing diagnostic tests that don't involve propagation of viral agents in vitro or in vivo.
- Nucleic acid extraction procedures involving untreated specimens.
- Preparation and chemical or heat-fixing of smears for microscopic analysis.

The following activities require BSL-3 facilities and BSL-3 work practices. When a procedure or process cannot be conducted within a biological safety cabinet, then appropriate combinations of personal protective equipment (e.g., respirators, face shields) and physical containment devices (e.g., centrifuge safety cups or sealed rotors) **must** be used.

- Viral cell culture
- Initial characterization of viral agents recovered in cultures of SARS specimens

Packaging and Shipping

Packaging, shipping and transport of specimens from suspect and probable SARS cases must follow the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations - www.iata.org/dangerousgoods/index and US DOT 49 CFR Parts 171-180 - hazmat.dot.gov/rules.htm. Step-by-step instructions on appropriate packaging and labeling can be viewed at the following CDC website: www.cdc.gov/ncidod/sars/pdf/packingspecimens-sars.pdf.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES SEVERE ACUTE RESPIRATORY SYNDROME (SARS) INFECTION CONTROL RECOMMENDATIONS POSTMORTEM AND PATHOLOGY PROCEDURES

The following updated recommendations are based on the CDC *Safe Handling of Human Remains of Severe Acute Respiratory Syndrome (SARS) Patients: Interim Domestic Guidance* issued May 15, 2003 (www.cdc.gov/ncidod/sars/autopsy.htm).

Healthcare workers who perform autopsies or who obtain pathology specimens from deceased patients should be thoroughly familiar with hospital infection control policies related to preventing the transmission of SARS. Infection control practitioners should observe autopsy and pathology procedures performed in their facility and develop and implement policies to protect healthcare workers as well as ensure that the environment is not a source of transmission.

Persons performing postmortem procedures should be required to use appropriate personal protective equipment with appropriate safety features. Mechanical devices used during autopsies can efficiently generate fine particle aerosols that may contain infectious organisms. Thus, personal protective equipment should include both protective garments and respiratory protection as outlined below.

Personal Protective Equipment

Healthcare workers, including pathologists and assistants, should follow hospital infection control policies for selecting and wearing protective garments and respiratory protection equipment. At a minimum, NIOSH-certified N95 respirators should be worn during autopsy procedures. Use of a higher level of respiratory protection (e.g., powered air purifying respirators) is strongly recommended and is necessary if N95 fit testing is unsuccessful.

For autopsies and postmortem assessment of SARS cases, personal protective equipment should include:

Protective garments: surgical scrub suit, surgical hooded caps that cover the skin on the face and neck, impervious gown or apron with full sleeve coverage, eye protection (e.g., tight fitting goggles), face shields, shoe covers and double surgical gloves with an interposed layer of cut-proof synthetic mesh gloves.

Respiratory protection: N95 or N100 respirators; or powered air-purifying respirators (PAPR) equipped with a high efficiency particulate air (HEPA) filter. PAPR are recommended for any procedures that result in mechanical generation of aerosols (e.g., oscillating saws). Due to uncertainty of the effectiveness of N95 or N100 respirators, the use of PAPR during high-risk aerosol generating procedures is strongly encouraged. Autopsy personnel who cannot wear N95

respirators because of facial hair or other fit limitations should wear PAPR. When PAPR are used, the filters should be replaced following the manufacturer's recommendation.

Autopsy procedures

For autopsies and postmortem assessment of SARS cases, safety procedures should include:

Prevention of percutaneous injury: Including never recapping, bending or cutting needles and ensuring that sharps disposal containers are available.

Handling of protective equipment: protective outer garments must be removed when leaving the immediate autopsy area and discarded in appropriate laundry or waste receptacles, either in an antechamber to the autopsy suite or immediately inside the autopsy suite entrance if an antechamber is not available. Hands should be washed upon glove removal.

Engineering strategies and facility design

Air handling systems: autopsy suites must have adequate air-exchanges per hour and correct directionality and exhaust of airflow. Autopsy suites should have a minimum of 12 air-exchanges per hour and should be at a negative pressure relative to adjacent passageways and office spaces. Air should not be returned to the building interior, but should be exhausted outdoors, away from areas of human traffic or gathering spaces (e.g., off the roof) and away from other air intake systems. For autopsies, local airflow control (i.e., laminar flow systems) can be used to direct aerosols away from personnel; however, this safety feature does not remove the need for appropriate personal protective equipment.

Containment devices: biosafety cabinets should be available for handling and examining small specimens. Oscillating saws are available with vacuum shrouds to reduce the amount of particulate and droplet aerosols. These devices should be used to reduce the risk of occupational exposure to SARS and other infectious agents.

Decontamination of Equipment

All equipment including autopsy tables, counter tops and instruments should be carefully cleaned with an EPA-registered detergent-disinfectant. Personnel responsible for decontamination procedures should wear full personal protective equipment including respirators during the cleaning process. After cleaning, instruments should either be autoclaved or placed in a FDA-approved high level disinfectant for the recommended time.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES

SEVERE ACUTE RESPIRATORY SYNDROME

INFECTION CONTROL RECOMMENDATIONS

HOME SETTINGS

Severe acute respiratory syndrome (SARS) is an illness that is spread by close personal contact with an ill person. Close personal contact means having cared for, having lived with, or having direct contact with the respiratory (lung or nasal) secretions or other body fluids of a person suspected of having SARS. Patients with SARS may transmit the infection to family members or friends. The duration of time before or after onset of symptoms during which a patient with SARS can transmit the disease to others is unknown. The following infection control recommendations have been developed for patients with suspected SARS in households or residential settings. These recommendations are consistent with the CDC *Interim Guidance on Infection Control Precautions for Patients with Suspected Severe Acute Respiratory Syndrome (SARS) and Close Contacts in Households*, April 29 (www.cdc.gov/ncidod/sars/ic-closecontacts.htm). The following *Model Home Isolation Agreement* can be used as an aid in implementing these recommendations, and can be converted into an Isolation Order if necessary to ensure compliance.

- SARS patients should limit interactions outside the home and should not go to work, school, out-of-home childcare, or other public areas until ten days after the end of fever and respiratory symptoms (cough, shortness of breath). During this time, infection control recommendations, as described below, should be used to minimize the potential for transmission.
- Friends and relatives should not visit until ten days after the ill person has no fever or respiratory symptoms.
- Household members should wash their hands with soap and water after gloved and ungloved contact with the ill persons respiratory (lung or nasal) secretions, blood and other body fluids (urine, wound drainage, etc.). Alcohol-based hand hygiene products can be used after removing gloves and when hands are not visibly soiled with respiratory secretions, blood and other body fluids.
- Use of disposable gloves should be considered for any direct contact with respiratory secretions, blood and other body fluids of a SARS patient. ***However, gloves are not intended to replace proper hand hygiene.*** Immediately after activities involving contact with body fluids, gloves should be removed and discarded, and hands should be washed. Gloves should never be washed or reused.
- Each patient with SARS should be advised to cover his or her mouth and nose with a facial tissue when coughing or sneezing. SARS patients should wear a surgical mask when in the same room as uninfected persons. If unable to wear a surgical mask, household members should wear surgical masks when in the same room as the patient.

- Sharing of eating utensils between SARS patients and other household members should be avoided. Dishes and utensils should be washed with hot water and a detergent after use by the ill person.
- Environmental surfaces in the kitchen, bathroom and bedroom should be cleaned at least daily with a household disinfectant according to manufacturer's instructions.
- The ill person's clothes, bed linens, towels should not be shared with well household members. Linens should be washed in cool to warm water and any commercial laundry product. Consider the use of gloves during this activity.
- Household waste soiled with respiratory secretions or other body fluids, including facial tissues and surgical masks, may be safely disposed as normal household waste.
- Household members or other close contacts of SARS patients who develop fever or respiratory symptoms should seek healthcare evaluation. When possible, inform the healthcare provider of the SARS exposure before going to the doctor's office or the emergency department.
- At this time, in the absence of fever or respiratory symptoms, household members or other close contacts of SARS patients need not limit their activities outside the home.

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
SEVERE ACUTE RESPIRATORY SYNDROME (SARS)
INFECTION CONTROL RECOMMENDATIONS
MODEL HOME ISOLATION AGREEMENT**

The California Department of Health Services (CDHS), Division of Communicable Disease Control (DCDC) has developed and distributed a Model SARS Isolation Agreement to local health departments (LHD). This agreement is to be used by the LHD to instruct patients with SARS symptoms of the necessary infection control precautions to be taken to prevent transmission to family members and other outside contacts. This agreement can be used verbatim or modified as necessary by the LHD. At the discretion of the local health officer, this isolation agreement can be converted to a home isolation order.

This agreement is being distributed to hospitals for information only and is not to be used when SARS patients are discharged from inpatient or outpatient healthcare settings unless specifically instructed to do so by the LHD. Patients with probable or suspect SARS who are discharged to home should be given the guideline *Severe Acute Respiratory Syndrome Infection Control Recommendations in Home Settings*. Infection control practitioners should inform hospital discharge planners and social workers of the necessity to provide specific discharge instructions to SARS patients and to notify the local health department by telephone within 24 hours prior to discharging a patient with suspected or probable SARS.

CDHS, DCDC Model SARS Isolation Agreement

I have been informed that I have been diagnosed as a suspect or probable case of Severe Acute Respiratory Disease (SARS) and that unless precautions are taken, others may contract this infection from me. Realizing this danger (and in accordance with Sections 120130 and 120175 of the State's Health and Safety Code), I hereby agree to the following:

- ☐ I shall remain in home isolation for a period of 10 days after my fever has resolved and respiratory symptoms (such as cough, shortness of breath, or difficulty breathing) are absent or improving.
- ☐ I shall be isolated at the following location:

Street address: _____

City: _____ County: _____ Zip: _____

Telephone: (____)____-_____

- ❑ I have been educated about the disease, the reasons for isolation in the home, and the length of time I can expect to be confined to the home.
- ❑ I shall limit all activities and interactions with all other persons living outside the home. I shall not go to school, church, work, out-of-home day care, stores or other public areas. Friends and relatives shall be informed not to visit my home until further notice.
- ❑ I shall have a separate bed and, if possible, a separate bedroom.
- ❑ I shall wear a surgical mask when in the same room with non-infected persons. If I cannot wear a surgical mask, others in the same room will be asked to wear a surgical mask.
- ❑ I shall cover my nose and mouth with a disposable tissue when coughing or sneezing. Disposable tissues will be disposed of in a plastic or paper bag.
- ❑ I and others living in the same household will wash our hands with soap and water after all contact with respiratory secretions (lung and nasal), blood and all other body fluids (e.g., urine, feces, wound drainage, etc.).
- ❑ All members of my household will wear gloves on both hands when they have contact with my respiratory secretions (lung and nasal), blood and all other body fluids (e.g., urine, feces, wound drainage, etc.). Alcohol-based hand hygiene products may be substituted for handwashing with soap and water, after removing gloves, **IF** the hands are not visibly soiled with respiratory secretions, blood and other body fluids. Gloves will not be reused.
- ❑ My eating and drinking utensils will be washed with hot water and a household dishwashing detergent.
- ❑ Environmental surfaces in the kitchen, bathroom and the infected patient's bedroom will be cleaned and disinfected with a household disinfectant, such as household bleach or Lysol®, while wearing gloves, at least daily and when soiled with the respiratory secretions, blood and other body fluids.
- ❑ My bed linens, towels and personal clothing shall not be shared with other members of the household. Clothes and linens will be washed in cool to warm water with any commercial laundry product.
- ❑ Household waste, including surgical masks and disposable tissues, soiled with respiratory secretions, blood or other body fluids will be disposed of as normal household waste.
- ❑ All members of my household or other close contacts who develop fever or respiratory symptoms will seek medical evaluation.

- ☐ To prevent transmission of SARS, members of the household who develop SARS symptoms will call the physician's office, clinic or hospital emergency department to alert healthcare workers of any pending visit.
- ☐ I agree to adhere to any additional recommendations and instructions from the local health officer that may be listed below:

I, or my legal guardian, may contact the following local health department representative to seek relief from, or seek clarification of, any part of this agreement.

(Name of local health department contact person)

(Daytime telephone)

Agreement:

_____, _____
(First) (Last)
(Name of SARS case/suspected case)

(Signature of SARS case/suspected case)

(Date)

Witness:

(Signature of Local Health Department representative)

(Date)